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NOTES.

In his *Varia Socratica,*[1] pages 151–155, A. E. Taylor discusses the familiarity of Socrates with mathematical science.

A new edition of the *Encyclopedia Americana* is nearing completion and is especially noteworthy here on account of the valuable mathematical articles contained therein. The edition is expected to comprise thirty volumes and the mathematical articles were prepared by a number of different American authors.

The following memoirs on ULISSE DINI have been recently published: By L. Bianchi in *Rendiconti della r. accademia dei Lincei, scienze fisiche,* Roma, 1919, (10 pages); by F. d'Arcais in *Atti del r. istituto Veneto di Scienze, lettere edarti,* Venezia, 1919 (7 pages).

A compiler of a mathematical dictionary might find the following recent volume in the Manuali Hoepli series of some service: D. M. Mele, *Dizionario internazionale di aeronavigazione e costruzioni aeronautiche, italiano, francese, inglese, tedesco con indice delle quattro lingue in alfabeto unico.* Milano, 1919. (7 + 227 pp.).

A new work by Professor A. N. Whitehead, entitled *An Enquiry concerning the Principles of Natural Knowledge,* has been published by the Cambridge University Press 12s. 6d. The four parts of the book deal with: The traditions of science, The data of science, The method of extensive abstraction, The theory of objects. In the investigation the scientific concepts of space and time are considered as the first outcome of the simplest generalization from experience.

The interesting and attractive first two numbers of *Norsk Matematisk Tidsskrift,* the official organ of the recently organized Norwegian Mathematical Society (*1919,* 324) are heartily welcomed by the MONTHLY. The first number, of 32 pages, contains articles on Sylow and his scientific work, on number theory polynomials and on an elementary proof of Kepler's first and second laws, besides brief notes, problems for solution, and news of the Society (which had 375 members on February 1, 1919). As inserts are also a fine portrait of Sylow and the laws of the Society. In addition to more problems, notes concerning the Society and its members, and book reviews, the second number, of 48 pages, contains articles on Indian mathematics, application of a formula for inversion to the theory of numbers, distribution of chance errors in observation, and graphical integration. The articles are written in Norwegian, Swedish, French, and German.

ARTICLES IN CURRENT PERIODICALS.

BOLLETTINO DI BIBLIOGRAFIA E STORIA DELLE SCIENZE MATEMATICHE, Volume 20, No. 3, 1918: "Sulla significato della parola 'prospettiva' usata nella legge sulla conservazione dei monumenti" by G. Pittarelli, 65–76; 17 reviews, 76–94 [including reviews by G. Loria of

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[1] First series (St. Andrews University Publications, No. IX), Oxford, Parker, 1911.

Miller's *Historical Introduction to Mathematical Literature* (New York, 1916), of Cajori's *William Oughtred, a great seventeenth-century teacher of mathematics* (London and Chicago, 1916), and of *Fundamental Conceptions of Modern Mathematics* by Richardson and Landis (Chicago, 1916)]; "Notizie," 94–96.

Common Ground, West Somerville, Mass., Volume 1, April, 1919: Mathematics in the elementary school and the junior high school," 7–15 [Report of the Committee on Curriculum of the Massachusetts Teachers' Federation].

Industrial Arts Management; New York, volume 8, February, 1919: "Mathematics for the apprentice," 58–62.

Journal of the Indian Mathematical Society, volume 11, no. 3, June, 1919: "Some definite integrals" by S. Ramanujan, 81–87; "Fractional differentiation" by M. T. Naraniengar, 88–95; "On a system of three similar triangles, connected with a given triangle," 96–99; "The theory of linear systems of points," 100–108; Addition formulas for $sn(u_1 + u_2 + u_3)$ etc." by F. H. V. Gulasekharam, 109–111; "On question 963" by V. R. Aiyar, 111–112; "Astronomical notes" by T. P. Sastri, 113; Solutions and questions for solution, 114–120; Periodicals received, i–iii.

Mathematical Gazette, Volume 9, July, 1919: "Mathematics in business and industry" by H. T. H. Piaggio, 361–364; "Gleanings far and near," 364, 368, 371; "Extension of the theory of inversion to conics" by J. J. Milne, 365–368; "Notes for lessons introductory to differential geometry" by E. H. Neville, 369–371; [Greeks, and the theorem coaxial triangles are copolar] by J. J. Milne, 372–373; "Geometrical construction for the trisection of an angle to any required degree of accuracy" by D. F. Ferguson, 373; "Reviews," 374–376.

Messenger of Mathematics, Volume 48, no. 4, August, 1918: "On Nielsen's functional equations" by G. N. Watson, 49–53; "On a simple summation of the series $\sum_{s=0}^{n-1} e^{2s^2\pi i/n}$" by L. J. Mordell, 54–56; "Radiation from a moving magneton" by H. Bateman, 56–64—No. 5, September: "Radiation from a moving magneton," 65–76; "On a diophantine problem" by H. Holden, 77–80—No. 6, October: "On a diophantine problem" by H. Holden, 81–87; "A simple proof of the fundamental equality in the theory of the gamma function" by S. Pollard, 87–89; "Notes on some points in the integral calculus" by G. H. Hardy, 90–96—No. 7, November: "Notes on some points in the integral calculus" (50) by G. H. Hardy, 97–100; "Method of expressing the cross-ratio of the range given by the roots of a biquadratic equation in terms of an auxiliary angle connected with the roots of the reducing cubic of the biquadratic" by A. Lodge, 100–107; "Notes on some points in the integral calculus" (51) by G. H. Hardy, 107–112—No. 8, December, 1918: "General pentaspherical coördinates" by T. C. Lewis, 113–128.

Mind, Volume 44, July, 1919: "Professor John Cook Wilson" by H. A. Prichard, 297–318 ["The death of John Cook Wilson, Wykeham Professor of Logic in Oxford since 1889, is a serious loss for philosophy. . . . The following summary of his life is condensed from a notice by Mr. H. W. B. Joseph in Vol. VII of the *Proceedings of the British Academy*, to which the reader is also referred for a sketch of his philosophy." Professor Wilson died in August, 1915. He was the author of *On the traversing of geometrical figures*, Clarendon Press, 1905]; "On occupying Space" by H. W. B. Joseph, 336–339; "A proof that any aggregate can be well ordered" by P. E. B. Jourdain, 382–384 [First sentence: "The account of my process for well-ordering any given aggregate M described in *Mind* for July, 1918 . . . has been criticised by some on grounds which show, I think, that the point of the process has not been grasped."]

Nouvelles Annales de Mathématiques, Volume 78, March, 1919: "Sur l'helicoëde gauche" by M. d'Ocagne, 81–89; "Sur une homographie particulière et son application a la perspective" by M. d'Ocagne, 89–92; "Sur une classe de courbes planes remarquables" by R. Goormaghtigh, 93–111; "Foyers rationnels des courbes" 112–113; "Applications géométriques de la théorie des infiniment petits" by M. d'Ocagne, 113–114; "Sur les courbes algébriques singulières sous le rapport des barycentres cycliques" by M. d'Ocagne, 115–116; Questions and solutions, 116–120—April: "Sur une application élémentaire d'une méthode générale donnant les équations du mouvement d'un système" by P. Appell, 121–131; "Sur les centres de courbure des lignes décrites par les points d'une figure plane mobile dans son plan" by M. d'Ocagne, 131–134; "Sur l'extraction, a une unité près, de la racine $m^{\text{ième}}$ d'un nombre quelconque a l'aide des logarithmes" by P. Deleus, 134–137; "Sur l'orthopole" by R. Goormaghtigh, 137–140; "Sur quelques intégrales trigonométriques" by M. F. Egan, 140–145; Questions and solutions, 145–160. —May: "Sur la méthode de Poincaré pour étudier la stabilité de l'équilibre" by P. Appell, 161–168; "Sur la détermination des surfaces minima" by C. Clapier, 169–176; "Sur un problème de géométrie infinitésimale" by R. Goormaghtigh, 177–184; "Sur un problème de mécanique" by E. Delassus, 184–188; problems and solutions, 188–200.

PSYCHOLOGICAL BULLETIN, Princeton, N. J., Volume 15, No. 12, December, 1918: "An easy method of determining the coefficient of correlation" by H. F. Adams, 456–459.

REVUE DE METAPHYSIQUE ET DE MORALE, Year 26, No. 3, May–June, 1919: "La question de la sincérité de Descartes" by G. Milhaud, 297–311; "Sur une définition possible des ordinaux transfinis" by A. Reymond, 313–334; "Sur la méthode d'enseignement des mathématiques et des sciences pour la formation du futur maître" by E. Rignano, 389–399.

REVUE DU MOIS, Tome 20, April, 1919: "L'orientation actuelle des mathématiques" by A. Denjoy, 18–28 [Discours d' installation dans la chaire de théorie des fonctions à l'université d'Utrecht, 3 Octobre, 1917].

REVUE GÉNÉRALE DES SCIENCES, Volume 30, No. 2, June 30, 1919: Review, by R. d'Adhémar, of Goursat's *Cours d'analyse mathématique*, tome 2, 3e éd. (Paris, 1918), p. 385; review by L. Potin of H. Bouasse's *Géographie mathématique* (Paris, 1919), 385–386.

SCIENCE, second series, Volume 50, August 8, 1919: "The problem of the boy in the swing" by H. Crew, 139–140.

SCIENCE PROGRESS, Volume 14, No. 53, July, 1919: "Recent advances in mathematics" by P. E. B. Jourdain, 1–10; "Recent advances in applied mathematics" by S. Brodetsky, 10–18; Essay-review, "The nature of number" by J. C. Gregory [on B. Russell's *Introduction to Mathematical Philosophy* (London, 1919)], 141–146; Reviews by P. E. B. Jourdain of A. Gray's *A Treatise on Gyrostatics and Rotational Motion: Theory and Applications* (London, 1918); of E. B. Elliott's *An Introduction to the Algebra of Quantics* (2d ed., Oxford, 1913); of H. B. Phillips's *Integral Calculus* (New York and London, 1917); of R. S. Heath's *Solid Geometry* (4th ed., London, 1919); and of W. P. Milne and G. J. B. Westcott's *A First Course in the Calculus* (London, 1918), 150–153.

TÔHOKU MATHEMATICAL JOURNAL, Volume 16, Nos. 1–2, June, 1919: "On measure of discontinuity and approximative representation of a function" by Y. Okada, 1–15; "On the approximation of a function of two variables by polynomials" by S. Takenaka, 16–25; "The popular books, Jinkôki and Kaisanki, in the Japanese mathematics" [in Japanese] by T. Hayashi, 26–40; "On some methods of construction in elementary geometry" by K. Yanagihara, 41–49 [section headings: 'Constructions with a ruler and compasses of given aperture'; 'Poncelet-Steiner's constructions'; 'constructions with a ruler of limited length and compasses of given aperture']; "Notes in elementary geometry" by T. Kubota, 50–52; "On the sum of two quadratic rests with respect to a prime ideal" by T. Matsumoto, 53–61; "On the theory of finite differences" by T. Kameda, 62–72; "A note on the convergence of the continued fraction with positive elements" by K. Shibata, 73–77; "On the mean center of the contact points of tangents to an algebraic curve and of tangent planes to an algebraic surface" by K. Shibata, 78–88; "Rational determination of the 'Wertigkeit' of algebraical correspondence on an algebraic curve" by M. Shibayama, 89–91; "Mathematical notes" by T. Kubota, 92–98; "On special systems of line equations having infinite unknowns" by K. Ogura, 99–102; "On the theory of approximating functions with applications to geometry, law of errors and conduction of heat" by K. Ogura, 103–154; "Some problems of circle and sphere divisions" by T. Hayashi, 155–159; "On the maximum modulus of norm-function" [in Japanese] by T. Hayashi, 160–171; New Books, Contents of Periodicals, Miscellaneous Notes, 172–183.

UNITED STATES NAVAL INSTITUTE PROCEEDINGS, Volume 45, July, 1919: "Great circle sailing—a few 'wrinkles' to save time" by H. G. S. Wallace, 1197–1199.—August: "Trajectories and their corrections" by A. G. Kirk, 1375–1395.

ZEITSCHRIFT FÜR MATHEMATISCHEN UND NATURWISSENSCHAFTLICHEN UNTERRICHT ALLER SCHULGATTUNGEN, Volume 50, No. 1, published Jan. 28, 1919: "Zum fünfzigsten Jahrgang der Zeitschrift" by W. Lietzmann, 1–7; "45 Jahre Aufgaben-Repertorium" by C. Müsebeck, 7–13; "Erinnerungen aus den ersten Jahren dieser Zeitschrift" by Hubert Müller, 13–18; "Die geometrische Periode in dem mathematischen Unterricht an der Breslauer Universität" by O. Toeplitz, 18–26; "Mathematische Wanderungen und Wandelungen in der Provinz Hessen-Nassau" by Carl H. Müller, 27–34; "Erinnerungen" by A. Schülke, 34–40; "Die Entwickelung des mathematischen Unterrichts im Sinne der Reformbewegung am Gymnasium in Göttingen'' by E. Götting, 40–47; "Winkelmessung durch Umlauf" by K. Schwering, 47–49; "Begabung und Studium" by W. Lorey [dedicated to F. Klein on the 50th anniversary of his doctorate and in honor of his 70th birthday], 49–56; "Der mathematische Verein München" by H. Wieleitner, 56–58; "Emil Lampe zum Gedächtnis" [with portrait] by E. Haentzschel, 58–60; "Bücherbesprechungen," "Zeitschriftenschau," and "Neuerscheinungen," 62–64—No. 2, published Feb. 20: "Einteilung der Dreiflache" by R. Sturm, 65–66; "Ueber Winkelteilung" by R. Sturm, 66–69; "Versuch einer Bestimmung der mittleren Strafzeit" by R. Sturm, 70–71; "Zum geometrischen Anfangsunterricht" by G. Kewitsch, 71–78; "Winkel an den Parallelen" by Münch, 78–81; "Kleine Mitteilungen," 81–93; "Aufgaben-Repertorium," 93–97; "Bücherbesprechungen," 100–112—No. 3, published March 21: "Ueber das 'Linearzeichnen' an den höheren Schulen und sein Verhältnis zum 'Freihandzeichnen'" by F. Schilling, 113–131; "Die Kollineation in Prima" by A. Gerlach, 131–137; "Kleine Mitteilungen," "Bücherbesprechungen," "Zeitschriftenschau," and "Neuerscheinungen," 138–152.

PROBLEMS AND SOLUTIONS.

EDITED BY B. F. FINKEL AND OTTO DUNKEL.

Send all communications about Problems and Solutions to B. F. FINKEL, Springfield, Mo.

PROBLEMS FOR SOLUTION.

2793. Proposed by J. L. RILEY, Stephenville, Texas.

If a, b, and c are complex and α, β, and γ real constants, the point

$$x = \frac{at^2 + 2bt + c}{\alpha t^2 + 2\beta t + \gamma}$$

traces a conic or a straight line when t takes all real values. *Stolz und Gmeiner.*

2794. Proposed by B. J. BROWN, Kansas City, Mo.

Find the value of $x^{e^x} \div x^{x^e}$ when $x \doteq 0$ and when $x \doteq \infty$. *I. C. S.* 1902.

2795. Proposed by C. N. SCHMALL, New York City.

A square is described touching the ellipse $x^2/a^2 + y^2/b^2 = 1$, at the ends of its minor axis; a second ellipse is drawn circumscribing the square and tangent to the given ellipse at the ends of the major axis. The new ellipse is treated as the first and the process is continued until there are n new ellipses. Show that the last ellipse is a circle if the eccentricity of the original ellipse is $\sqrt{n/(n+1)}$.

2796. Proposed by N. P. PANDYA, Amreli, India.

Construct a triangle ABC having its centroid on a given ellipse, AB being a fixed diameter of the ellipse and C lying on one of the directrices.

2797. Proposed by E. J. OGLESBY, College of William and Mary.

Solve for x and y the simultaneous equations, $x^3 + y^3 = 35$ and $x^2 + y^2 = 13$.

2798. Proposed by S. A. COREY, Des Moines, Iowa.

Prove that every positive integer is equal to the sum of at most four squares.

SOLUTIONS OF PROBLEMS.

406 (Algebra) [March, 1914]. Proposed by S. A. COREY, Albia, Iowa.

Solve the system of equations:

$$(1 - x)(a_1 + a_2y + a_3z) = d, \qquad (1 - y)(b_1 + b_2x + b_3z) = g, \qquad (1 - z)(c_1 + c_2x + c_3y) = h.$$